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ABSTRACT

Although technology education has been discussed for a decade, it is still uncertain how teachers feel about this new curriculum. Industrial technology education teachers from Idaho and Nebraska were randomly surveyed about their acceptance of technology education. A questionnaire was sent to a sample of 73 teachers in Nebraska and 58 teachers in Idaho (total of 131). Evaluation used Hall's Stages of Concern (SoC) model. The questionnaires of the 80 teachers who returned them (about 60 percent in each state) were grouped for data analysis by state, educational level, years of teaching experience, age, school type, and school size. The SoC profiles indicated that 24 percent of the teachers had accepted technology education, whereas 76 percent had not accepted this educational change. Idaho teachers indicated a 76 percent higher acceptance rate than Nebraska teachers. Analysis indicated that school size had a statistically significant impact on teachers' acceptance of technology education, with teachers in medium-sized schools most likely to have accepted technology education. Possible explanations for the overall lack of acceptance include the following: (1) technology education advocates have failed to show any relative advantage of the curriculum to the teachers asked to implement the change; (2) the technology education curriculum was externally developed; (3) technology education change agents, especially in Nebraska, ignored the feelings of industrial technology education teachers by failing to provide inservice training; and (4) the previous change experience of the industrial arts teachers may not have been positive. Recommendations were made to increase teachers' acceptance of technology education by taking their feelings into account and by providing inservice education. (Contains 14 references.) (Author/KC)

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A COMPARISON OF THE ACCEPTANCE OF TECHNOLOGY EDUCATION BETWEEN IDAHO AND NEBRASKA TEACHERS

A Research Paper
Presented At
The American Vocational Association
1992 Convention
Saint Louis, Missouri

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Abstract

Although technology education has been discussed for a decade, there is still uncertainty as to how teachers feel with regard to this new curriculum. Industrial technology education teachers from the states of Idaho and Nebraska were randomly selected and examined for their acceptance of technology education utilizing Hall's Stages of Concern (SoC) model. The 80 teachers were grouped for data analysis by state, educational level, years of teaching experience, age, school type, and school size. The SoC profiles indicated that 23.75% of the teachers had accepted technology education, while 76.25% had not accepted this educational innovation. Idaho teachers indicated a 76.4% higher acceptance rate than Nebraska teachers. Analysis indicated that school size had a statistically significant impact on teachers' acceptance of technology education (Chi-Square 8.439, df=2, p=.015). Possible explanations for this lack of acceptance are provided.

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Over the last decade, numerous manuscripts and presentations have been made addressing the transition from industrial arts education to technology education. However, White (1990) noted that this shift still remains a hotly debated issue. Oaks (1991) stated that literature related to this transition is basically repeat information about new technology education curriculum or dealing with superficial name changes. "As important as these name changes are, industrial arts will not be technology education until underlying philosophical differences between industrial arts and technology education are understood and accepted by instructors" (White, 1990, p. 1).

Literature Review

According to Oaks (1991), there is limited research dealing with the transition from industrial arts education to technology education. Initial research located on the adoption of technology education was by Swanson (1984). In this study, Swanson asked 150 Minnesota industrial arts teachers to classify their programs as technology, contemporary industrial arts, or traditional industrial arts. The results indicated only ten (6.7%) were classified as technology. The

vast majority. 110 (73.3%), were classified as traditional industrial arts education. Rogers (1989) assessed the adoption of technology education by industrial arts teachers in Omaha. Nebraska utilizing Hall's (1979) Stages of Concern model. This study indicated none of the respondents had adopted the philosophy of technology education. but rather held strong to traditional industrial arts education.

Smallwood (1989) investigated Indiana's industrial arts teachers' feelings toward technology education. The study indicated no difference in the acceptance of technology education between school settings such as urban. rural, or suburban and no difference in acceptance with regard to the professional involvement of the industrial arts teachers.

The basic outcome of Smallwood's research was that "Indiana industrial arts teachers have mixed reactions regarding technology education". (p. 35) This lack of clear indication of technology education acceptance by Indiana's teachers suggests the need for further research in this area.

Rogers (1991) re-examined the acceptance of of Omaha. Nebraska industrial arts teachers again via Hall's (1979) Stages of Concern model. The data from

this research indicated that the majority of industrial arts teachers (77.5%) had failed to accept technology education. The data also revealed the older and more experienced teachers were redefining the concept of technology education prior to its acceptance.

Purpose

The purpose of this study was to ascertain the technology education acceptance level of both Idaho and Nebraska industrial technology education teachers. Additionally, this research was conducted to compare the teachers' acceptance level with regard to school size, school type, years of teaching experience, instructors' age, and instructors' educational level.

In order to address this question, Hall's (1979) Stages of Concern (SoC) model was utilized. Hall's SoC views the acceptance of educational change as an on going process. The SoC describes an individual's feelings, perspectives, and attitudes as they consider or accept the use of technology education. A teacher's individual SoC moves from early self concerns to task related concerns and then to concerns about the impact of the innovation. Hall's SoC levels can be seen in Table 1.

Table 1

Stages of Concern about the Innovation

6. REFOCUSING: Focus on exploration of more universal benefits from the innovation. Individual has definite ideas about alternatives.
5. COLLABORATION: The focus is on coordination with others regarding use of the innovation.
4. CONSEQUENCE: Attention focuses on impact of the innovation on students in the individual's sphere of influence.
3. MANAGEMENT: Attention is focused on the processes and tasks of using the innovation and best use of resources.
2. PERSONAL: Individual is uncertain about the demands of the innovation and the role of the innovation.
1. INFORMATION: A general awareness of the innovation and interest in learning more about it.
0 AWARENESS: Little concern about or involvement with the innovation is indicated.

Methodology

This study examined to what level of Hall's (1979) Stages of Concern Idaho and Nebraska industrial technology education teachers have progressed relative to the acceptance of technology education. The research methodology consisted of mailing a questionnaire to industrial technology education teachers from both Idaho and Nebraska. The returned questionnaires were then analyzing utilizing the chi-square treatment to determine any statistically significant differences.

Instrumentation

Hall and Rutherford's (1976) Stages of Concern Questionnaire (SoCQ) was utilized to measure both Idaho and Nebraska industrial technology education teachers' attitudes toward technology education. The SoCQ evolved from Hall's Concerns Based Adoption Model, which hypothesizes that individuals progress through the seven different stages of concern as they accept an innovation. The thirty-five items on the questionnaire represent the seven stages of concern with five items utilized for each stage. Each question is rated via a

seven-point Likert-type scale.

Estimates of internal consistency, alpha coefficients, for the seven SoC stages assessed via the SoCQ range from .64 to .83 (Wedman et al. 1986). Hall and Rutherford (1976) noted that the SoCQ was a valid measure of the educational change examined.

In addition to the SoCQ, a demographic data sheet was utilized. Demographic information obtained included: school size, school type, years of teaching experience, teacher's age, and the teacher's educational level.

Population

The population of this research consisted of the industrial technology education teachers from the states of Nebraska and Idaho. This population was derived from the listings of industrial technology education teachers, as provided by the Nebraska Department of Education and the Idaho Division of Vocational Education. These listings indicated 500 Nebraska teachers and 186 Idaho teachers. Vocational T&I teachers were not included in the population. This provided a total population of 686 industrial technology education teachers.

Sample Selection

The sample was selected utilizing a stratified random sampling technique. Each state's industrial technology education teachers comprised an independent stratum. The sample sizes needed for each stratum were determined utilizing the formula provided by Nunnery and Kimbrough (1971). This calculation incorporated the technology education acceptance percentages found in three previous studies: Swanson (1984), Rogers (1989), and Rogers (1991). According to Nunnery and Kimbrough (1971), if a stratified sampling method is used, the sample size for each stratum should be computed independently. Therefore, the sample sizes needed for both Nebraska industrial technology education teachers and Idaho industrial technology education teachers were calculated separately.

The calculated sample size needed for Nebraska was 73 individuals and the needed sample size for Idaho was 58 teachers. Thus, the total sample to be surveyed was 131 industrial technology education teachers or 19.0% of the population.

Data Collection

The SoCQ, demographic information sheet, and a cover letter were mailed to the 131 randomly selected industrial technology education teachers. Seventy-three Nebraska teachers were mailed the questionnaire and 58 Idaho teachers received the instrument. The response rate was 62% for Nebraska educators (n=45) and 60% for Idaho teachers (n=35).

The 80 returned SoCQs were scored utilizing Hall's (1979) Stages of Concern Scoring Device. Raw scores were first tabulated, calculated to percentiles, and each graphed into SoC profiles. Raw data was also grouped and scored by state, school type, school size, years of teaching experience, teachers' age, and the teachers' educational level for further analysis.

Data Analysis

Analysis of the 80 individual SoC profiles indicated that 19 of the industrial technology education teachers (23.75%) had SoC intensity peaks in one of the later four SoC stages, thus indicating an acceptance of technology education. While 76.25% of the teachers' SoC intensity peaks (n=61) were in the first three stages, indicating they had not yet

accepted this educational innovation (see Table 2).

An individual or group that has accepted an educational innovation would have its SoC intensity peak in one of the later four SoC stages (management, consequence, collaboration, or refocusing). Twenty-nine of the teachers' SoC intensity peaks were in the personal stage, which is also where the total sample's SoC profile peak was indicated (see Figure 1).

In examining the Nebraska industrial technology education teachers' individual SoC profiles, only eight (17.8%) indicated acceptance of technology education (see Table 3). The majority of Nebraska teachers (82.2%) had not progressed past the SoC personal stage.

The SoC profiles of Idaho industrial technology education teachers indicated a 76.4% greater acceptance of technology education than Nebraska teachers. Of the 35 Idaho respondents, 31.4% had SoC profile intensity peaks at or above the management stage, thus indicating an acceptance of technology education. Even though the Idaho teachers had a greater acceptance rate then Nebraska's teachers, the majority of Idaho teachers (68.6%) had SoC profiles indicating non-acceptance of technology education.

Applying the chi-square statistical treatment to

the technology education acceptance levels of the two states' teachers indicated no significant difference at the a=.05 level (Chi-Square 1.242, df=1, p=.247).

In analyzing the industrial technology education teachers by age, only one teacher (6.3%) over the age of 50 years had a SoC profile indicating acceptance (see Table 4). This finding was consistent with the studies of Smallwood (1989) and Rogers (1991). Teachers between the ages of 41 and 50 had the highest acceptance level at 32.0%. Statistically these was no difference between teachers of different age levels (Chi-Square 3.722, df=2, p=.155).

Analysis of the instructors by years of teaching experience noted results similar to the age level analysis (see Table 5). Data indicated one teacher with over 26 years of teaching experience had accepted technology education. Statistical analysis revealed no significant difference between teachers regarding years of teaching experience (Chi-Square 9.097, df=5, p=.105).

Examining acceptance of technology education by educational level noted that 24.5% of teachers holding a bachelor's degree and 22.2% of teachers having a master's degree had SoC profiles indicating acceptance.

There was no significant difference between teachers relating to educational level (see Table 6).

Analysis of the respondents SoC profiles by type of school can be seen in Table 7. The acceptance rates were 38.9% for junior high/middle school, 24.2% for senior high schools, and 13.8% for grade 7-12 schcols. Statistically there was no difference pertaining to type of school (Chi-Square 3.870, df=2, p=.144).

Table 8 depicts the analysis of SoC profiles by school size. The acceptance rate for large schools, as defined on the questionnaire, was 21.4%, with none of Nebraska large school teachers indicating acceptance. The rate for medium sized schools was 41.4% and acceptance rate of technology education in the smaller schools was 10.8%. The chi-square treatment noted a significant difference between the industrial technology education teachers with regard to the size of their school (Chi-Square 8.439, df=2, p=.015).

Item Analysis

An item analysis of the responses to the 35 questions on the SoCQ revealed that the highest rated responses were on questions one (5.61), 11 (5.73), 15 (5.49). 24 (5.69), and 29 (5.74). While the lowest

average ratings were on questions three (1.11), 12 (1.44), 21 (2.00), 23 (2.00), and 30 (1.29). The Likert-type scale ranged from one, not true of me, to seven, very true of me. These questions can be seen in Tables 9 and 10.

Findings

The data collected and analyzed by this study indicated the following:

1. Technology education has not been accepted by over three fourths (76.25%) of Nebraska and Idaho industrial technology education teachers.

2. Idaho industrial technology education teachers had accepted technology education at a 76.4% higher rate than their Nebraska counterparts.

3. Industrial technology education teachers over the age of 50 years had a lower acceptance rate than the younger teachers.

4. Industrial technology education teachers with more than 25 years of teaching experience had a lower acceptance rate than newer teachers.

5. School size had a statistically significant impact on the acceptance of technology education (Chi-Square 8.439, df=2, p=.015).

Discussion

The data clearly indicated that the majority of Nebraska industrial technology education teachers have failed to accept the new technology education curriculum. While Idaho industrial technology education teachers had accepted this educational innovation at a higher rate. Idaho's promotion of technology education through an in-service program may have assisted in this higher acceptance rate.

In 1987 Idaho conducted six three-day statewide workshops on the technology education curriculum change. These workshops were followed by over 60 two college credit seminars on implementing technology education. The Idaho Division of Vocational Education also provide 20 $10,000 grants per year.

Even though Idaho's teachers had a higher acceptance rate than Nebraska's teachers, the majority of both states' industrial technology education teachers had failed to accept technology education. Possible explanation for this lack of acceptance could be:

1. Technology education advocates had failed to show any relative advantage of the curriculum to the

teachers asked to implement the change (Rogers, 1989).

2. The technology education curriculum was externally developed. Teachers are more likely to accept an change they helped developed. (Rutherford, Hall, & Huling, 1983).

3.Technology education change agents, especially Nebraska, ignored the feelings of industrial technology education teachers by failing to provide adequate in-service training on the adoption of the new curriculum. (Rutherford, Hall, & Huling, 1983).

4. The previous change experience of the industrial arts teachers may have not been positive (Rutherford, Hall, & Huling, 1983).

5. The technology education programs may not have been suited to the schools' needs (Loucks & Melle, 1980).

6. The technology education proponents may not have invested enough time nor enough funds in the diffusion of their innovation (Loucks & Melle, 1980).

Recommendations

The recommendations of this research need to be addressed if technology education advocates wish to continue their pursuit of replacing traditional

industrial arts education with technology education.

1. When diffusing the educational innovation of technology education, change agents must constantly monitor the teachers for their acceptance level.

2. Technology education change agents need to provide teacher in-service training for industrial arts teachers because " the industrial arts instructor is not fully or properly equipped for the new technology education curricular thrust" (Wright, 1990, p. 25).

Weissglass (1991) noted that staff development is the key to successful educational change. He suggested that providing information "is not sufficient to over come the obstacles to change caused by the culture of schools" and the teachers' "lack of awareness of the need for change". (p. 32) He indicated the following steps should be taken by staff developers:

1. Breakdown the isolation of the instructors.
2. Improve instructors' listening skills.
3. Provide opportunities for instructors to express their feelings about the change.
4. Address instructors' personal concerns.
5. Establish instructor support networks.

Figure 1. SoC Profile of the Total Sample.

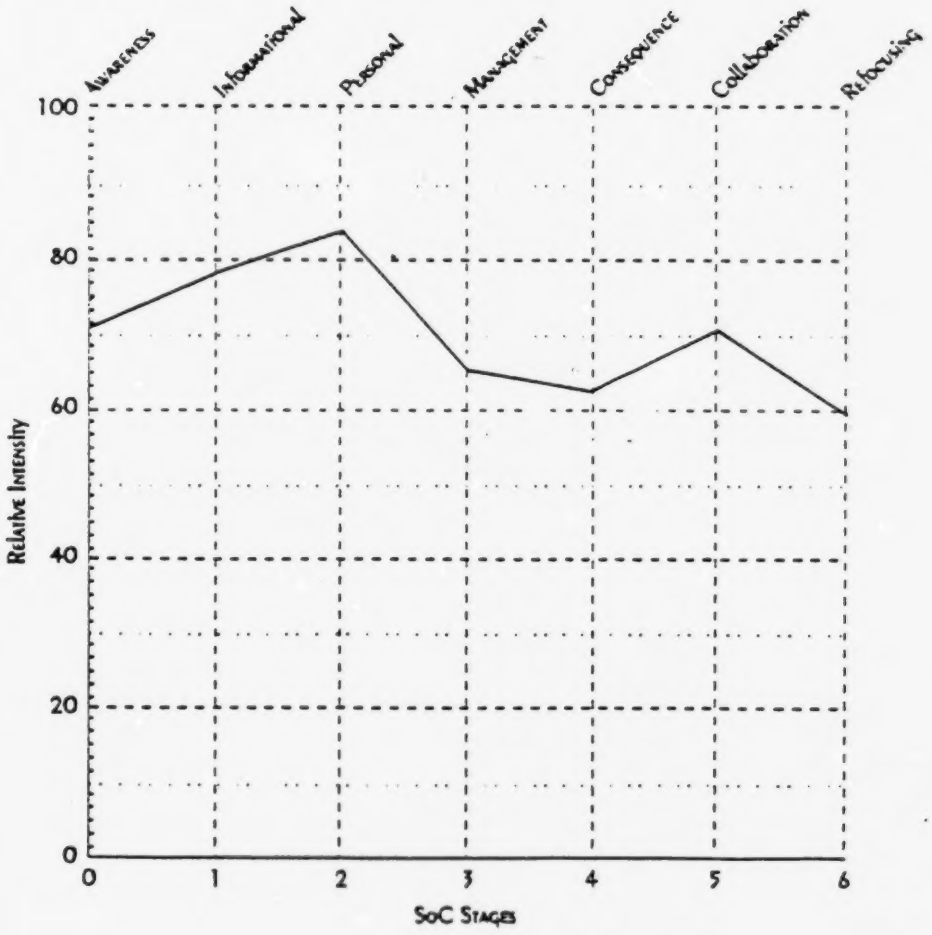

Table 2

SoC Stages of The Total Sample

SoC Level	n	%	Intensity
Awareness	11	13.75	70.8
Information	21	26.25	78.5
Personal	29	36.25	82.7
Management	5	6.25	65.4
Consequence	3	3.75	62.6
Collaboration	6	7.50	70.8
Refocusing	5	6.25	59.4
Total	80		

Table 3

SoC Stages of Nebraska and Idaho Teachers

	Nebraska		Idaho	
SoC Level	n	%	n	%
Awareness	9	20.0	2	5.7
Information	13	28.9	8	22.9
Personal	15	33.3	14	40.0
Management	0	0.0	5	14.3
Consequence	2	4.4	1	2.9
Collaboration	3	6.7	3	8.6
Refocusing	3	6.7	2	5.7
Totals	45		35	

Chi-Square 1.342, df=1, p=.247

Table 4

SoC Stages by Teachers' Age

	20-40 Years		41-50 Years		51 Plus Years	
SoC Level	n	%	n	%	n	%
Awareness	4	10.3	5	20.0	2	12.5
Information	10	25.6	4	16.0	7	43.8
Personal	15	38.5	8	32.0	6	37.5
Management	1	2.6	3	12.0	1	6.3
Consequence	1	2.6	2	8.0	0	0.0
Collaboration	4	10.3	2	8.0	0	0.0
Refocusing	4	10.3	1	4.0	0	0.0
Totals	39		25		16	

Chi-Square 3.722, df=2, p=.155

Table 5

SoC Stages by Years of Teaching Experience

	1-5 Years		6-10 Years		11-15 Years	
SoC Level	n	%	n	%	n	%
Awareness	2	12.5	1	9.1	2	20.0
Information	3	18.8	0	0.0	4	40.0
Personal	6	37.5	5	45.5	3	30.0
Management	0	0.0	1	9.1	0	0.0
Consequence	1	8.3	0	0.0	0	0.0
Collaboration	2	12.5	2	18.2	0	0.0
Refocusing	2	12.5	2	18.2	1	10.0
Totals	16		11		10	

Table 5 (continued)

SoC Stages by Years of Teaching Experience

	16-20 Years		21-25 Years		25+ Years	
SoC Level	n	%	n	%	n	%
Awareness	3	14.3	2	15.4	1	11.1
Information	7	33.3	3	23.1	4	44.4
Personal	9	42.9	3	23.1	3	33.3
Management	2	9.5	1	7.7	1	11.1
Consequence	0	0.0	2	15.4	0	0.0
Collaboration	0	0.0	2	15.4	0	0.0
Refocusing	0	0.0	1	7.7	0	0.0
Totals	21		13		9	

Chi-Square 9.097, df=5, p=.105

Table 6

SoC Stages by Teachers' Educational Level

	BS		MS	
SoC Level	n	%	n	%
Awareness	7	13.2	4	14.8
Information	15	28.3	6	22.2
Personal	18	34.0	11	40.7
Management	4	7.5	1	12.0
Consequence	2	3.8	1	3.7
Collaboration	4	7.5	2	7.4
Refocusing	3	5.7	2	7.4
Totals	53		27	

Chi-Square .003, df=1, p=.961

Table 7

SoC Stages by Type of School

	JH/MS		SHS		7-12	
SoC Level	n	%	n	%	n	%
Awareness	1	5.6	5	15.2	5	17.2
Information	4	22.2	8	24.2	9	31.0
Personal	6	33.3	12	36.4	11	37.9
Management	1	5.6	3	9.1	1	3.4
Consequence	1	5.6	1	3.0	1	3.4
Collaboration	4	22.2	1	3.0	1	3.4
Refocusing	1	5.6	3	9.1	1	3.4
Totals	18		33		29	

Chi-Square 3.870, df=2, p=.144

Table 8

SoC Stages by School Size

	Small		Medium		Large	
SoC Level	n	%	n	%	n	%
Awareness	8	21.6	1	3.4	2	14.3
Information	12	32.4	3	10.3	6	42.9
Personal	13	35.1	13	44.8	3	21.4
Management	0	0.0	3	10.3	2	14.3
Consequence	0	0.0	3	10.3	0	0.0
Collaboration	3	8.1	2	6.9	1	7.1
Refocusing	1	2.7	4	13.8	0	0.0
Totals	37		29		14	

Chi-Square 8.439, df=2, p=.015

Table 9

Very True of Me Responses

1. I am concerned about students' attitudes toward technology education. (5.61)

11. I am concerned about how technology education affects students. (5.73)

15. I would like to know what resources are available if we adopt technology education. (5.49)

24. I would like to excite my students about their part in technology education. (5.69)

29. I would like to know what other faculty are doing in this area. (5.74)

Table 10

Not True of Me Responses

3. I don't even know what technology education is. (1.11)

12. I am not concerned about technology education. (1.44)

21. I am completely occupied with other things. (2.00)

23. Although I don't know about technology education, I am concerned about things in the area. (2.00)

30. At this time, I am not interested in learning about technology education. (1.29)

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